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(54) ELECTRICMOTORDRIVEN LINEAR RECIPROCATING MOTION DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To easily adjust the tension of a belt in an electric-motor-driven linear reciprocating motion device.

SOLUTION: A guide rail 13 is provided along the lengthwise direction in a widthwise direction central part of a housing 10, four driven side pulleys 21 to 24 are rotatably provided in a corner part of the housing 10, a timing belt 25 linked to these driven side pulleys 21 to 24 is provided in a manner surrounding the guide rail 13, the timing belt 25 is connected to a slide block 15 slidably provided in the housing 10, so as to drive the timing belt 25 by a motor 26 having a drive side pulley 28. Both end parts of the timing belt 25 are mounted in the slide block 15 by belt mounting fixtures 31, 32, and they are moved, so that the tension of a belt can be easily adjusted.

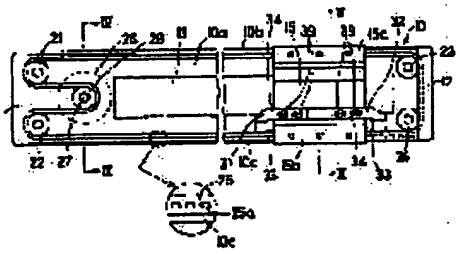

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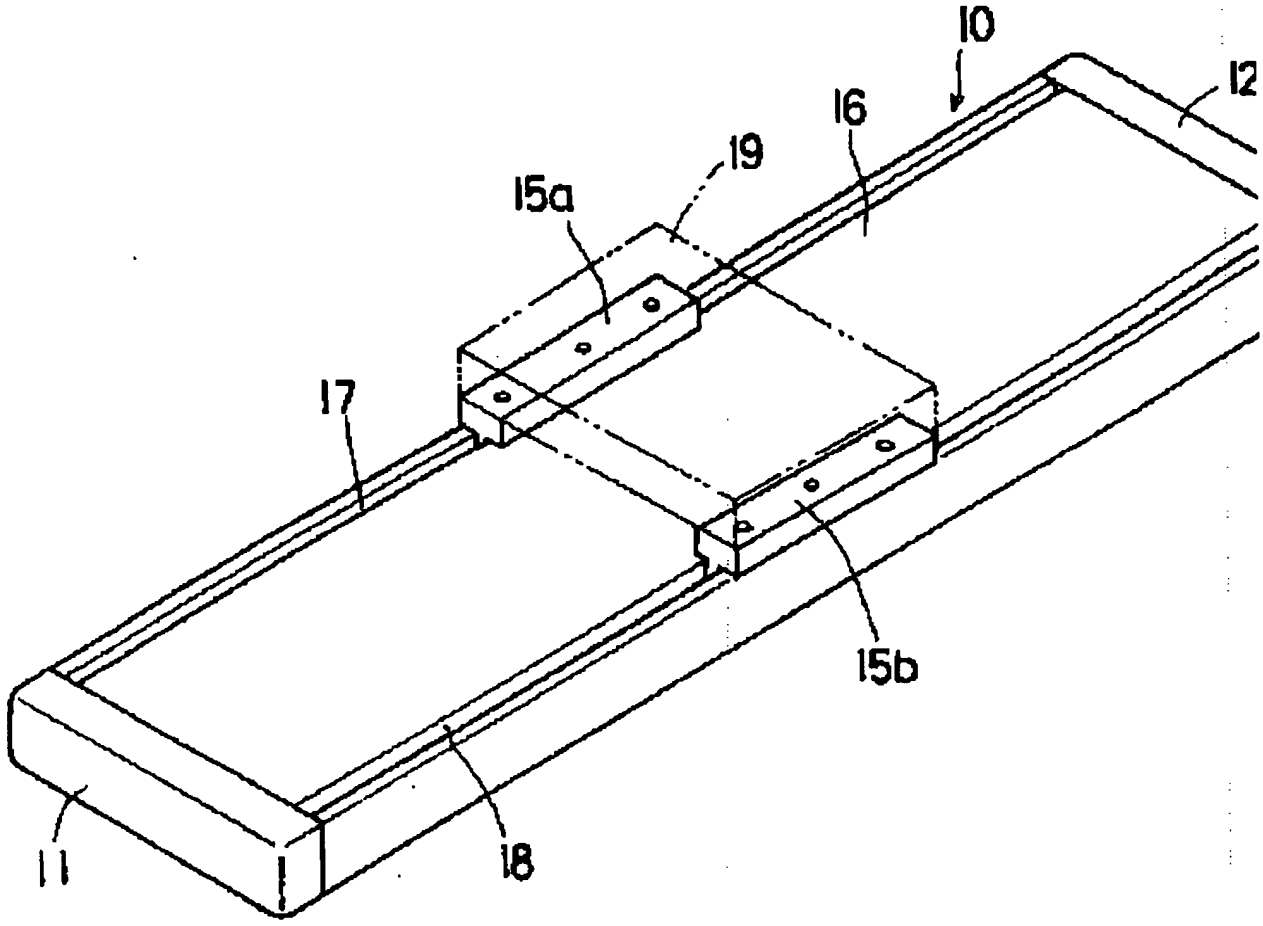
図1



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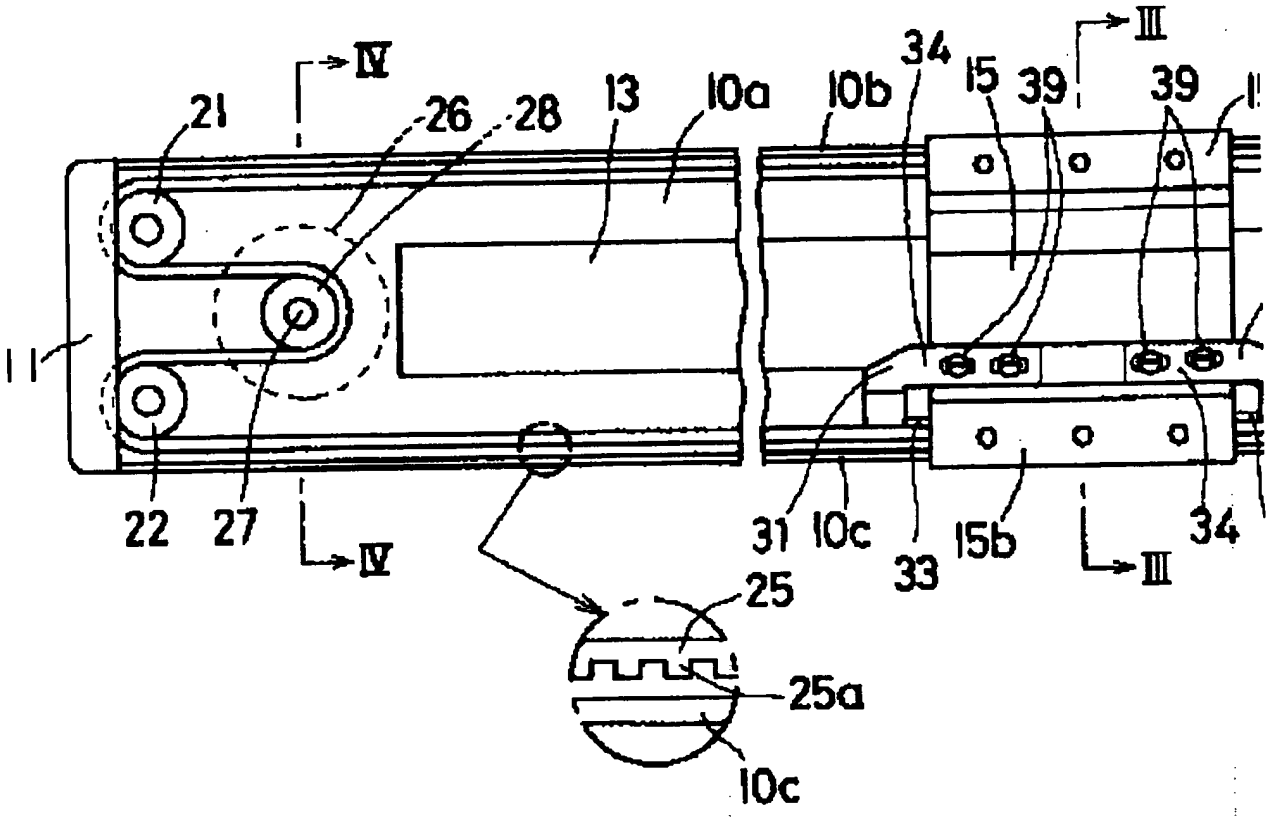
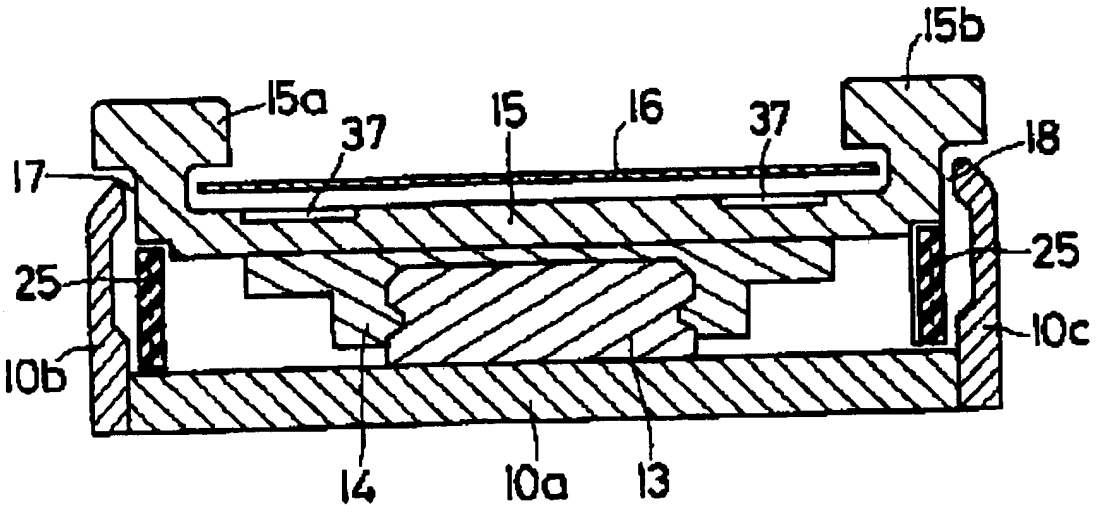


１０：ハウジング	２２：従動側プーリー	２６：モー
１３：ガイドレール	２３：従動側プーリー	２８：駆動
１５：スライドブロック	２４：従動側プーリー	３１：ベル
２１：従動側プーリー	２５：タイミングベルト	３２：ベル

図3



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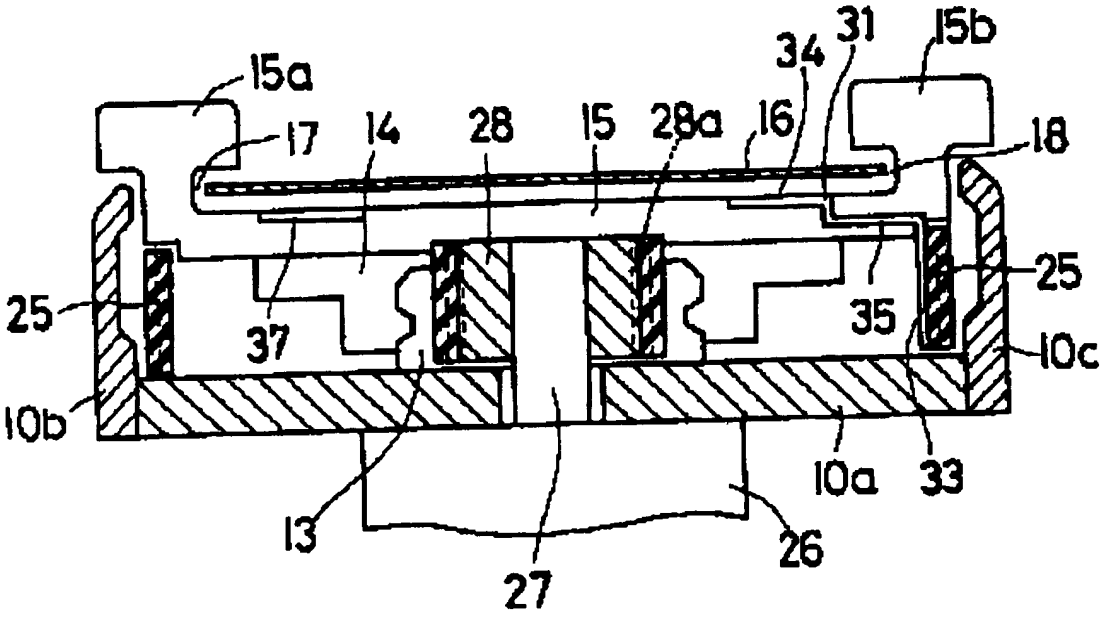
15a
17
14
28
15
28a
16
34
31
15b
18
25
25
37
35
10c
10b
10a
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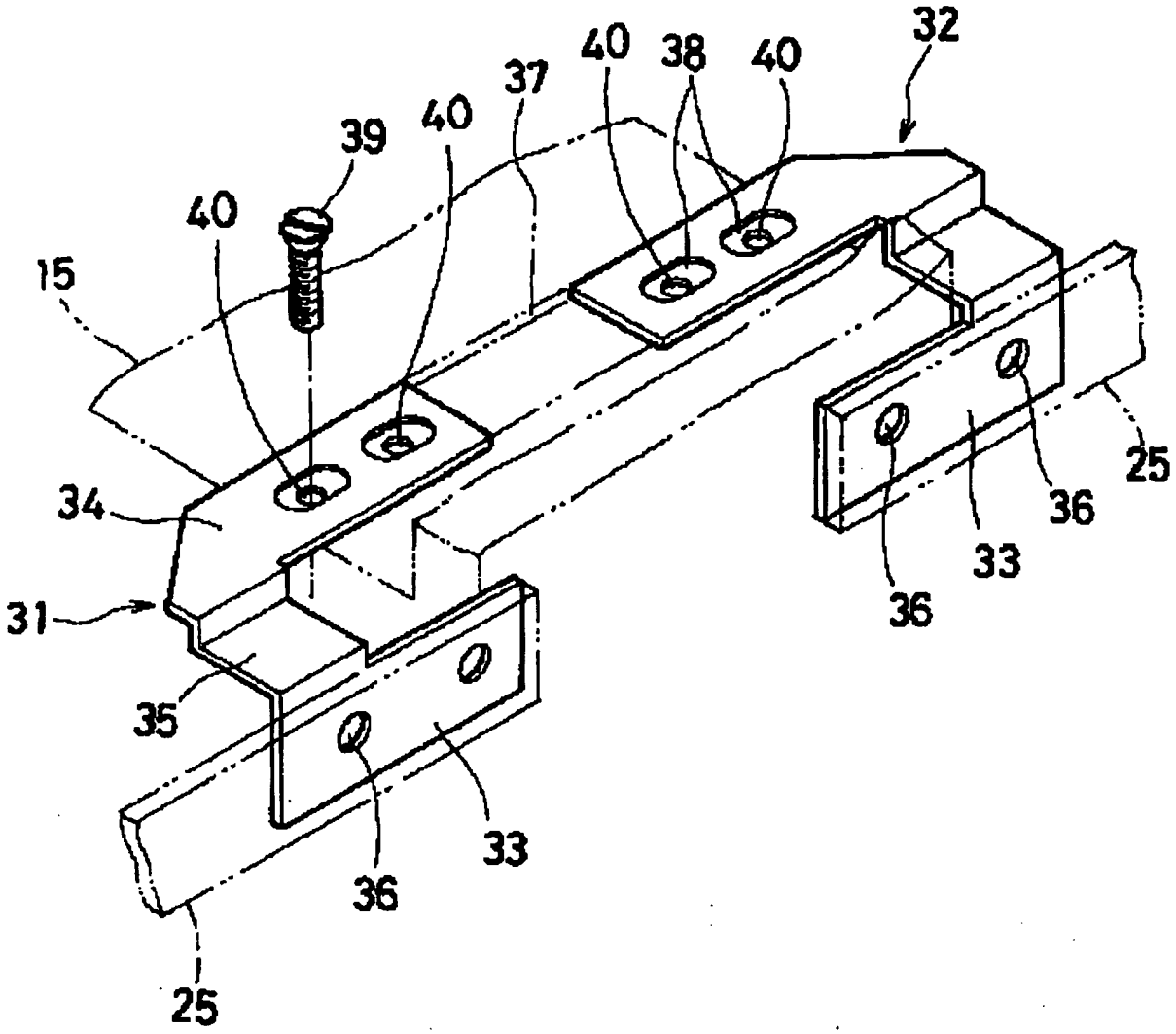
13
27
26

図5



* NOTICES *

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] The guide rail which is along a crosswise center section at a longitudinal direction, and housing with which a pulley is prepared in both ends respectively free [rotation], The slide block prepared in the longitudinal direction of said housing free [sliding] along with said guide rail, The belt over which is located in the outside of said guide rail and said pulley is built and which is connected with said slide block, It has two belt fixtures equipped with the conclusion section concluded by the belt fixed part fixed to the edge of the electric motor which drives said pulley, and said belt of predetermined die length, and said slide block, respectively. The through tube which the **** member which was formed in said slide block, and which ****s, ****s to a hole and is combined with it penetrates is formed in each conclusion section of each of said belt fixture. The electromotive straight-line reciprocator characterized by considering as the long hole which turned to the direction where a belt is prolonged in said through tube formed in the conclusion section of one [at least] belt fixture.
[Claim 2] The electromotive straight-line reciprocator characterized by being an electromotive straight-line reciprocator according to claim 1, having prepared said pulley in each of the four corners of said housing, and building said pulley over said belt as said guide rail is surrounded.

[Translation done.]

* NOTICES *

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates migration members, such as a slide table which supports a work piece, to the electromotive straight-line reciprocator it was made to reciprocate in the direction of a straight line.
[0002]
[Description of the Prior Art] In order to convey a work piece from a certain location to other locations or to move the hand and tool which grasp a work piece between a processing location and an evacuation location, straight-line reciprocation of the migration members, such as a slide table, may be carried out. This straight-line reciprocator is also called a slide unit or slider, and has the thing of a type it was made to drive a migration member through the timing belt driven with an electric motor.
[0003]
[Problem(s) to be Solved by the Invention] As such a straight-line reciprocator, it equips with a slide block free [sliding] along with a guide rail, this slide block is connected with belts, such as a timing belt, and there is a thing of a type it was made to drive this belt with an electric motor.
[0004] Management of components becomes troublesome and using the belt beforehand formed in the shape of a loop formation, if manufacture of two or more kinds of straight-line reciprocators with which the reciprocation stroke of a slide block was mutually different is taken into consideration, although this belt becomes loop formation-like, the shape of i.e., endless, and it will be attached in equipment makes a manufacturing cost it not only cannot to desire improvement in manufacture efficiency, but rise.
[0005] Then, he is trying to form a loop-formation-like belt by concluding the both ends of this to a slide block using the belt which is cut by predetermined die length and has both ends. Therefore, if it is in the electromotive straight-line reciprocator using a belt, the activity which concludes the both ends of a belt to a slide block becomes unescapable.
[0006] ****, **** through the through tube of a belt to a hole, **** a member, and it is made to join together, and although the attempt which formed the through tube in the both ends of a belt, and was formed in the slide block until now and which concludes the both ends of a belt to a slide block was made, tension of a belt cannot be adjusted by this method. In order to adjust the tension of a belt, he is trying to move the pulley built over the belt until now.
[0007] The purpose of this invention is to offer the electromotive straight-line

reciprocator having the belt which can adjust tension.
[0008] The other purposes and the new description will become clear from description and the accompanying drawing of this specification along [said] this invention.
[0009]
[Means for Solving the Problem] It will be as follows if the outline of a typical thing is briefly explained among invention indicated in this application.
[0010] Namely, the electromotive straight-line reciprocator of this invention The guide rail which is along a crosswise center section at a longitudinal direction, and housing with which a pulley is prepared in both ends respectively free [rotation], The slide block prepared in the longitudinal direction of said housing free [sliding] along with said guide rail, The belt over which is located in the outside of said guide rail and said pulley is built and which is connected with said slide block, It has two belt fixtures equipped with the conclusion section concluded by the belt fixed part fixed to the edge of the electric motor which drives said pulley, and said belt of predetermined die length, and said slide block, respectively. The through tube which the **** member which was formed in said slide block, and which ****s, ****s to a hole and is combined with it penetrates is formed in each conclusion section of each of said belt fixture. It is characterized by considering as the long hole which turned to the direction where a belt is prolonged in said through tube formed in the conclusion section of one [at least] belt fixture.
[0011] The tension of a belt can be easily adjusted by moving a belt fixture, without moving a pulley, if it is in this electromotive straight-line reciprocator.

[0012]
[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained to a detail based on a drawing.
[0013] It is III-III [in / drawing 1 is the perspective view showing the appearance of the electromotive straight-line reciprocator which is the gestalt of 1 operation of this invention, and drawing 2 is the top view of drawing 1 in the condition of having removed covering, and / in drawing 3 / drawing 2]. It is the sectional view which meets a line, drawing 4 is a sectional view which meets the IV-IV line in drawing 2 , and drawing 5 is the perspective view showing a belt fixture.
[0014] The electromotive straight-line reciprocator to illustrate has the metal housing 10 which became a rectangle mostly, as this housing 10 is shown in drawing 3 and drawing 4 , it consists of bottom plate 10a and side plates 10b and 10c, and the cross section serves as a cup configuration. The caps 11 and 12 formed in the both ends of this housing 10 with resin, respectively are stopped.
[0015] The slide block 15 is being fixed to the guide block 14 which the guide rail 13 is formed in that crosswise center section along with the longitudinal direction, and was prepared in bottom plate 10a of housing 10 free [sliding] to this guide rail 13 as shown in drawing 2 . Therefore, with guide block 14, a slide block 15 is guided at a guide rail 13, and reciprocates in the direction of a straight line.
[0016] The crosswise center section of this is attached in the covering 16 of a wrap sake by housing 10, and the predetermined clearances 17 and 18 are formed between this covering 16 and the side plates 10b and 10c of housing 10. A direct

work piece is supported, or a slide block 15 has the supporters 15a and 15b which project up through clearances 17 and 18, a work piece is supported through the support table 19 fixed to this part by Supporters 15a and 15b, and a work piece is conveyed by the slide block 15.

[0017] As shown in drawing 2 , in housing 10, every 2 a total of four follower side pulleys 21-24 are formed free [rotation] in the corner of the both ends, respectively, and, as for these follower side pulleys 21-24, the peripheral face serves as a flat. These follower side pulleys 21-24 are built over the timing belt 25, one side serves as a flat side, and tooth part 25a is formed in the other side. And the driving-side pulleys 21-24 are built over the timing belt 25 by making into an outside the side in which tooth part 25a was formed. As for tooth part 25a of a timing belt 25, the part is shown in drawing 2 , and tooth part 25a of other parts of a plot for convenience omits, and is shown.

[0018] The thing of predetermined die length is used and this timing belt 25 serves as the shape of the shape of endless, i.e., endless, and a loop formation as a whole by concluding those both ends to a slide block 15.

[0019] Since a timing belt 25 is driven, as shown in drawing 4 , the motor 26 is attached in bottom plate 10a of housing 10, and the driving-side pulley 28 is being fixed to the shaft 27 of this motor 26. This driving-side pulley 28 is located in the crosswise center section of housing 10, and rather than the follower side [two] pulleys 21 and 22 of housing 10 prepared in the edge on the other hand, is shifted at the longitudinal direction center-section side of housing 10, and is located.

[0020] As shown in drawing 4 , it has external-tooth 28a, and the timing belt 25 is built over the driving-side pulley 28 in the part this pushed out from between the follower side [two] pulleys 21 and 22 to the center-section side, and the driving-side pulley 28 gears with tooth part 25a by which tooth part 28a of the driving-side pulley 28 was prepared in the timing belt 25. Therefore, the drive of a timing belt 25 is transmitted to a slide block 15 by driving a motor 26 and driving a timing belt 25.

[0021] Since the follower side pulleys 21-24 are formed in the corner of the both ends of the rectangular housing 10, respectively and these were built over the timing belt 25 so that it might illustrate, a timing belt 25 is arranged so that it may move along with the side plates 10b and 10c of housing 10. On the other hand, since the guide rail 13 for guiding a slide block 15 is formed in the crosswise center section of housing 10 along with the longitudinal direction, the timing belt 25 and the guide rail 13 are arranged so that these may overlap in a longitudinal direction, i.e., the thickness direction of a timing belt 25, in drawing 3 and drawing 4 , so that a timing belt 25 may surround a guide rail 13 that is,. Thereby, the dimension of the vertical direction in drawing of housing 10 can be made small, and thin shape-ization of equipment is attained.

[0022] The both ends of a timing belt 25 are attached in the slide block 15 using the belt fixtures 31 and 32, respectively. When the detail of each belt fixture 31 and 32 is shown, it is as drawing 5 .

[0023] Each belt fixture 31 and 32 is formed by bending a plate, it has the conclusion section 34 concluded by the belt fixed part 33 to which the edge of a timing belt 25 is fixed, and the slide block 15, and these are connected by the connection section 35. As shown in drawing 4 , the belt fixed part 33 became parallel to side plate 10c, and is prolonged in the longitudinal direction of

housing 10.
[0024] Moreover, the conclusion section 34 became a right angle mostly to the belt fixed part 33, is prolonged in parallel, and is prolonged in the longitudinal direction of housing 10 along the front face of a slide block 15. The connection section 35 is bent in the shape of a stage while it is prolonged crosswise [of housing 10]. Although the belt fixed part 33 and the conclusion section 34 have shifted in the vertical direction in drawing 3 and drawing 4 of housing 10 mutually, since it is bent in the shape of a stage, it will be in the condition of having shifted in the vertical direction by the connection section 35, and the belt fixed part 33 and the conclusion section 34 are connected.
[0025] It ****s to each belt fixed part 33, a hole 36 is formed, and the edge of a timing belt 25 is fixed to the belt fixed part 33 by the **** member which ****s to this screw-thread hole 36, and is combined with it. However, you may make it fix the edge of a timing belt 25 using adhesives.
[0026] The slot 37 where the conclusion section 34 of each belt fixture 31 and 32 engages with a longitudinal direction free [sliding] is formed in the front face of a slide block 15, and the conclusion section 34 is concluded by the slide block 15 where a slot 37 is entered. Every two through tubes 38 are formed in the conclusion section 34, and each through tube 38 is the long hole which turned to the direction where a belt is prolonged.
[0027] It ****s to a slide block 15 and the **** hole 40 with which a member 39 ****s and is combined is formed, and the **** hole 40 makes two belt fixtures 31 and 32 correspond, by two, it makes a pair and is formed at a time a total of two pairs. It is separated from two screw-thread holes 40 which form a pair of the distance corresponding to the distance of the center to center of two long holes formed in one belt fixture.
[0028] In order to conclude a timing belt 25 to a slide block 15, while preparing the timing belt 25 which the belt fixtures 31 and 32 ****ed to both ends, and was beforehand fixed to them by the member or adhesives and building each follower side pulleys 21-24 over this timing belt 25, two belt fixtures 31 and 32 are concluded to a slide block 15 using four screw-thread members 39. At this time, where each screw-thread member 39 is loosely attached in the **** hole 40, as the both ends of a timing belt 25 are made to approach mutually, predetermined tension is applied to a timing belt 25.
[0029] Under this condition, by binding the **** member 39 tight, a timing belt 25 serves as predetermined tension, and will be attached in a slide block 15. However, after ****ing the belt fixture 31 where one belt fixture 31 is drawn near to the other end side of a timing belt 25, and binding tight by the member 39, you may make it apply predetermined tension to a timing belt 25, as the belt fixture 32 of another side is turned to one belt fixture 31 and made to approach. It is almost good also as a circular hole corresponding to the **** hole 40, without making into a long hole the through tube 38 of the belt fixture attached first, when such an attachment method is made.
[0030] Since the **** member 39 is attached from the front-face side of a slide block 15 in case the screw-thread member 39 is ****ed, it ****s to a hole 40 and it joins together, the screw-thread stop activity can be done easily. Moreover, when a timing belt 25 loosens by [predetermined] carrying out period use of the equipment, prevention of slack of a timing belt 25 and adjustment of tension can be easily performed by carrying out adjustment migration so that one [at least] belt

fixture 31 may be turned and brought near by the belt fixture 32 of another side. Since it holds in the belt fixture 31 and the 32 fang furrow 37 in case the tension of a belt is adjusted, adjustment migration of the belt fixtures 31 and 32 can be easily carried out correctly with a predetermined posture along this slot 37.
[0031] Next, explanation of the procedure of conveying a work piece using an electromotive straight-line reciprocator carries a work piece for a slide block 15 on a slide block 15 in the condition of the longitudinal direction of drawing 1 and drawing 2 of on the other hand being located in an edge. If a motor 26 drives in this condition, a timing belt 25 will drive and a slide block 15 will be driven in the direction of a straight line. Thereby, a work piece is conveyed by the position of a longitudinal-direction another side edge.
[0032] Although the driving-side pulley 28 is formed in the crosswise center section of housing 10 when illustrating, a variation rate is carried out and you may make it form the driving-side pulley 28 in crosswise one side. Thereby, the near tooth space in which the motor 26 is not formed among the inferior surfaces of tongue of housing 10 can be used effectively.
[0033] When illustrating, the slot 37 is established in the front face of a slide block 15 to the crosswise both ends of a slide block 15, and you may make it conclude the belt fixtures 31 and 32 using which slot 37.
[0034] As mentioned above, although invention made by this invention person was concretely explained based on the gestalt of operation, it cannot be overemphasized that it can change variously in the range which this invention is not limited to the gestalt of said operation, and does not deviate from the summary.
[0035] for example, right and left among the both ends of the housing [in / in the driving-side pulley 28 / drawing 2] 10 -- you may make it prepare in which edge Moreover, although he is trying to install equipment horizontally in illustrating, you may make it install in a perpendicular direction or the inclination direction.
[0036]
[Effect of the Invention] It will be as follows if the effectiveness acquired by the typical thing among invention indicated in this application is explained briefly.
[0037] (1) The tension of the belt for changing rotation of . shaft into straight-line reciprocation of a slide block can be easily adjusted using a belt fixture, without moving a pulley.
[0038] (2) . -- tension can be adjusted easily, without disassembling equipment from the front face of a slide block on the occasion of this adjustment using a tool.
[0039] (3) Since . deer also prepared the belt as it surrounded the guide rail, the miniaturization of equipment can be attained.

[Translation done.]